

Multidimensional integration of absorbances: An approach to absolute analyte detection

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Abstract

The problem of absolute analyte detection is considered in this paper. It is shown that integration in absorbance, not in intensity, is a pre-requisite for absolute detection in atomic absorption spectrometry. A design for an atomic absorption spectrometer of the future is described which measures absorbance resolved in three key areas: wavelength, space and time. Intensity must be measured with sufficient temporal, spatial and spectral resolution to guarantee the accuracy of the computed absorbance. Technically, such measurements can be made simultaneously with a continuum source, a high resolution echelle spectrometer and a two dimensional solid-state array detector. All computed absorbances are fully background and stray light corrected. With such measurements, and a proper optical configuration, absolute analyte detection can become a reality and the possibility of absolute analysis becomes more obtainable.
